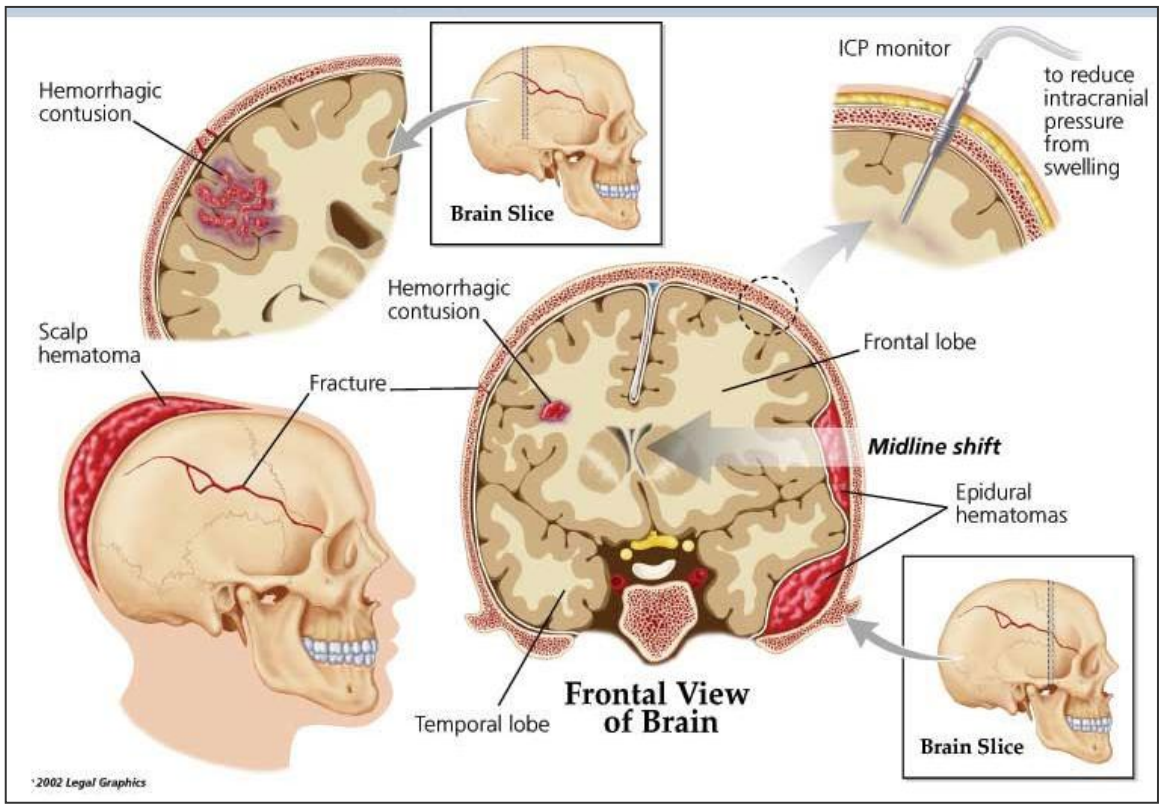
Traumatic Brain Injury Fatalities in Louisiana

2000-2005 Cumulative Report



EMS/Injury Research & Prevention Section

STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS
OFFICE OF PUBLIC HEALTH

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Introduction

Traumatic Brain Injury (TBI) is one of the leading causes of death and disability to children and young adults in the United States and Louisiana. An estimated 5.3 million individuals, approximately 2% of the United States' population, are living with a disability resulting from a TBI.

An analysis of 2000-2005 Louisiana mortality data indicates that 5,596 individuals died as a result of a TBI. Several thousand more individuals will not recognize that they have sustained a preventable injury (as in closed head trauma from sports or falls) capable of causing long-term deficits. TBIs can have a deep impact on families and communities and are resource-intensive, both financially and emotionally.

TBIs can be markers of inadequate prevention policies, correctable environmental hazards (e.g., uneven sidewalks that precipitate falls), and other injury-prevention opportunities. Alcohol-impaired driving, unsafe boating, unsafe bicycling, and violence can be assessed separately. Pedestrian injuries may be linked to poor signage, alcohol use, poor outdoor lighting, and unsafe pedestrian paths. Falls may be linked to home safety, work safety, playground safety, and other environmental obstacles. Violence injuries may be linked to gun use, aggression, alcohol use, and child abuse. These examples show how programs not particularly aimed at reducing brain injuries may use the same data to plan and evaluate prevention and intervention strategies.

The majority of TBIs are preventable. That fact, coupled with the seriousness and prevalence of their occurrence, makes TBIs a public health concern. The Louisiana State Legislature has established the Traumatic Brain and Spinal Cord Injury Registry and has mandated the reporting of these events.

Traumatic Brain Injury Facts

In 2005, firearm related deaths were the leading cause of TBI deaths, followed by motor-vehicle crashes and falls. Analyzing TBI deaths by age group allows for the development of targeted interventions in sub-populations. Motor-vehicle crashes were the leading cause of injury among youth from birth to 24 years of age. Fall-related TBIs, in turn, were the leading cause of injury among persons aged 75 and older.

Injury is an important public health issue in the United States today. Injury is the leading cause of death and disability among children and young adults and is responsible for the deaths of approximately 150,000 people each year.[1] Injury is among the top eight causes of death for all age categories and comes in as the fifth overall cause of death across all ages.[2] Injuries also claim more years of potential life lost before the age of 65 (YPLL-65) than any other cause (over three and a half million years).[3] Unintentional injury claimed more than two million years in 1994. In comparison, the next most common cause of YPLL-65 is cancer, which claimed under two million years.

Injuries are preventable. Scientific methods can be used to prevent injury. By describing the problem using surveillance techniques, identifying factors that put people at risk for injury, and designing, implementing, and evaluating interventions targeting those risk factors, the burden of injury can be decreased.[1]

Injuries to the brain and spinal cord are most likely to result in death or permanent disability and are a serious health problem in the United States.[4] An estimated 1.5 million people sustain a traumatic brain or spinal cord injury each year in the United States.[2] These injuries are a major public heath problem in part because of the permanence of the resulting disability, the high cost of hospitalization and rehabilitative treatment, as well as the fact that they occur more frequently to young people.

Traumatic brain injuries have a deep impact on communities throughout the United States. We need a coordinated response from the public health community to prevent injuries and reduce disabilities.[5] In addition, these non-fatal traumatic brain and spinal cord injuries represent a major economic burden to society. The estimated annual cost of traumatic brain injuries in the United States is over $224 billion.[1]

The Louisiana legislature mandated the reporting of traumatic brain injuries (TBI) in 1990. This report summarizes the results of Louisiana residents who died as a result of a traumatic brain injury from 2000 to 2005.

Traumatic Brain Injury

Summary

Multi-state surveillance data estimates the national annual incidence rate of traumatic brain injury (TBI) at 95 per 100,000 U.S. residents.[6]

From January 1, 2000 to December 31, 2005, 5,596 Louisiana residents died as a result of a traumatic brain injury. This resulted in an overall TBI mortality rate of 21 per 100,000 Louisiana residents. Males were 3 times more likely to experience a TBI than females. Consistent with the national figures, we see the highest rates among persons aged 15 to 24 and among the elderly (Figure).

Firearm-related injuries were the leading cause of traumatic brain injury, followed by motor vehicle crashes and falls (Figure). The highest mortality rates, for all causes of injury, were falls among those 75 years and older. The mortality rate for motor vehicle crash-related TBI were highest among persons aged 15 to 24 years (Figure).

Approximately one-half of firearm-related TBI were mainly intentional in nature (self harm)(Figure). In almost two-thirds of motor vehicle crash-related TBI deaths the injured person was the occupant of a car or truck (Figure). Majority of the fall-related TBI deaths were the unspecified due to incomplete ecodes.(Figure).

For the cases where the location of the injury was known nearly, one-third of all persons who died as a result of a traumatic brain injury in Louisiana between 2000 and 2005 were injured at home.(Figure).

The following charts and commentary on pages….. provide a more in-depth report on TBI deaths in Louisiana during 2000-2005.

Figure 1

TBI Mortality Rates by Year, LA 2000-2005
(N=5596)

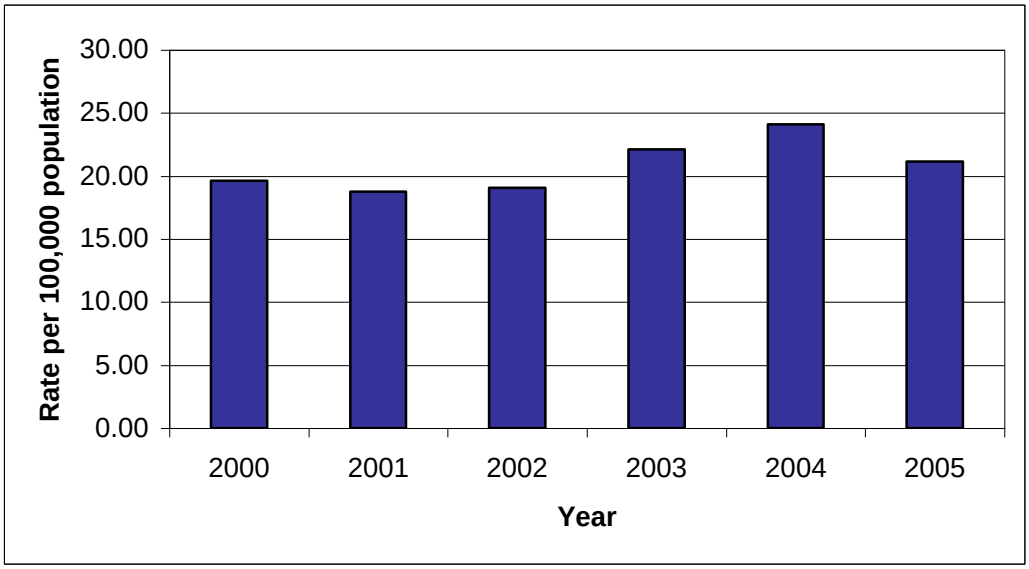
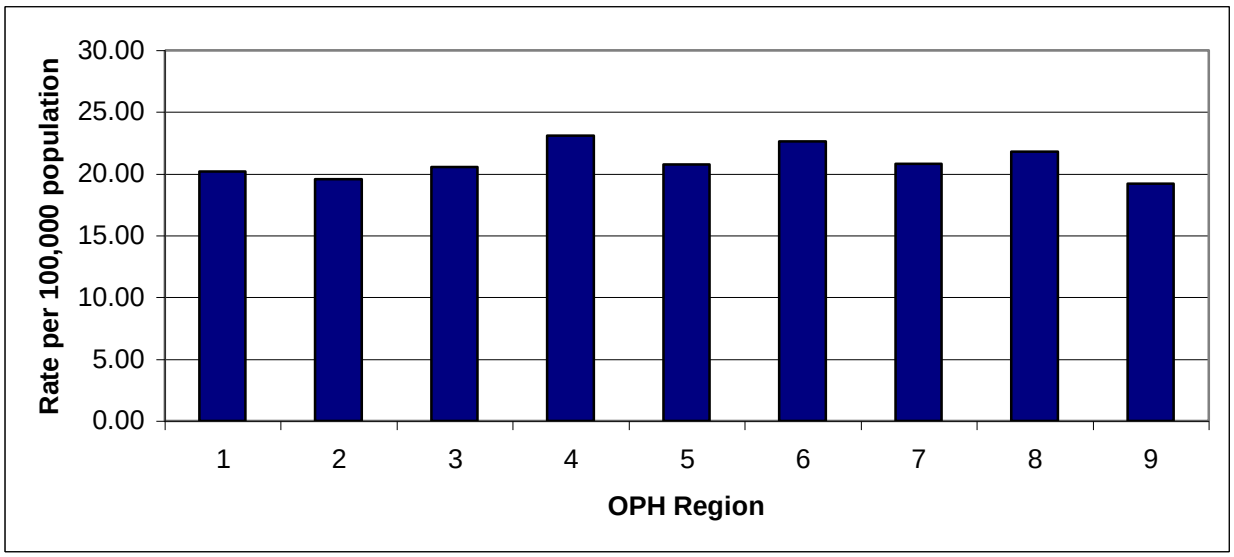


Figure 2

Mean Annual TBI Mortality Rates by Region of Residence, LA 2000-2005
(N=5596)

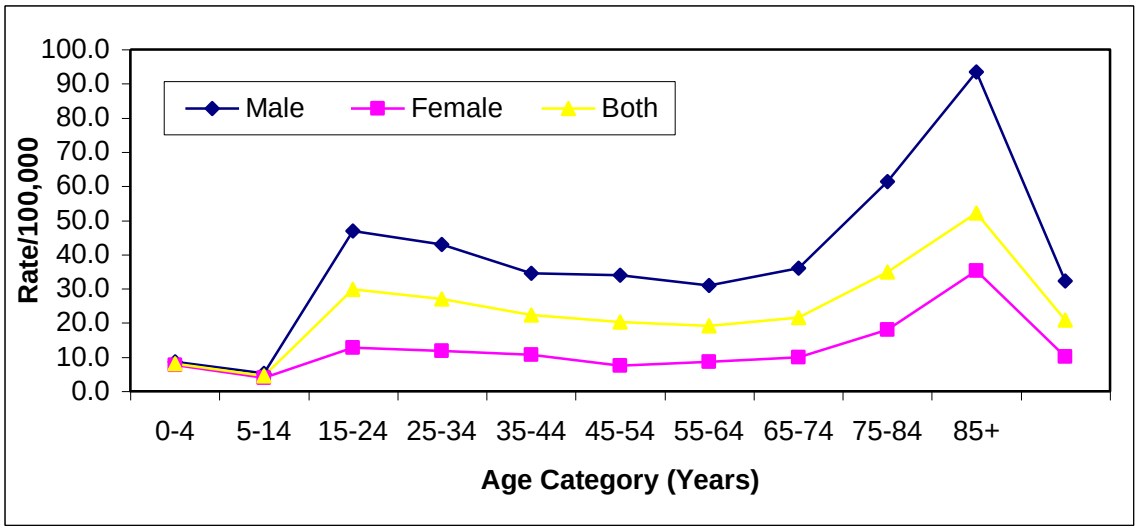


missing cases = 7

The average annual TBI mortality rate for Louisiana between 2000 and 2005 was 20.8 per 100,000 residents. The highest mortality rate of TBI was seen in Region 4 - (23.1 per 100,000), followed by Region 9 - (19.1 per 100,000).

Figure 3

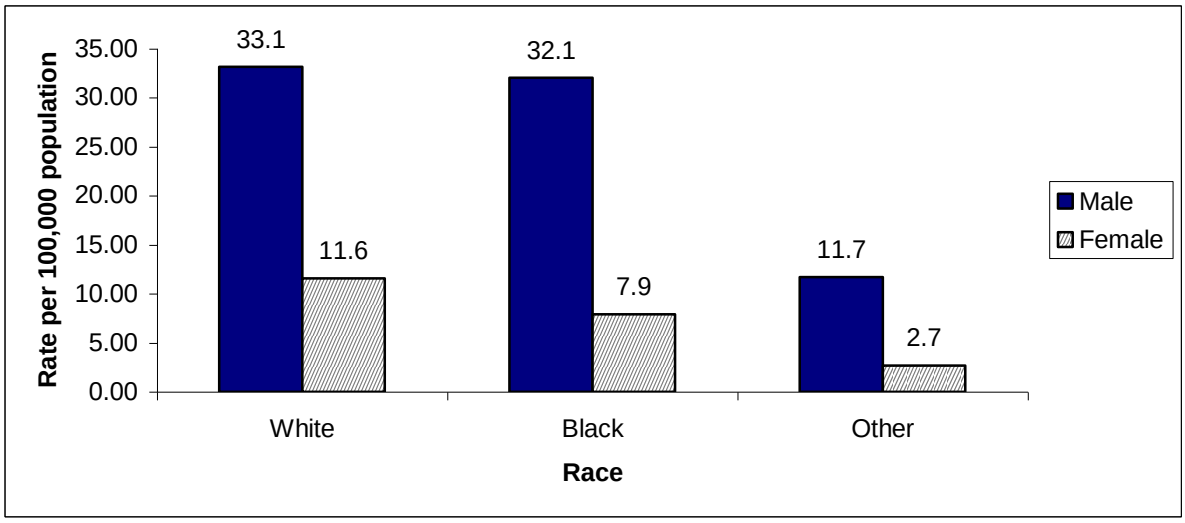
Mean Annual TBI mortality rate by Age Category, LA 2000-2005
(N=)



This figure shows the average mortality rates of traumatic brain injury by age category and gender. Consistent with national estimates, rates peak among persons 15-24 years of age and among the elderly. Rates for males were consistently higher in all age groups.

Figure 3

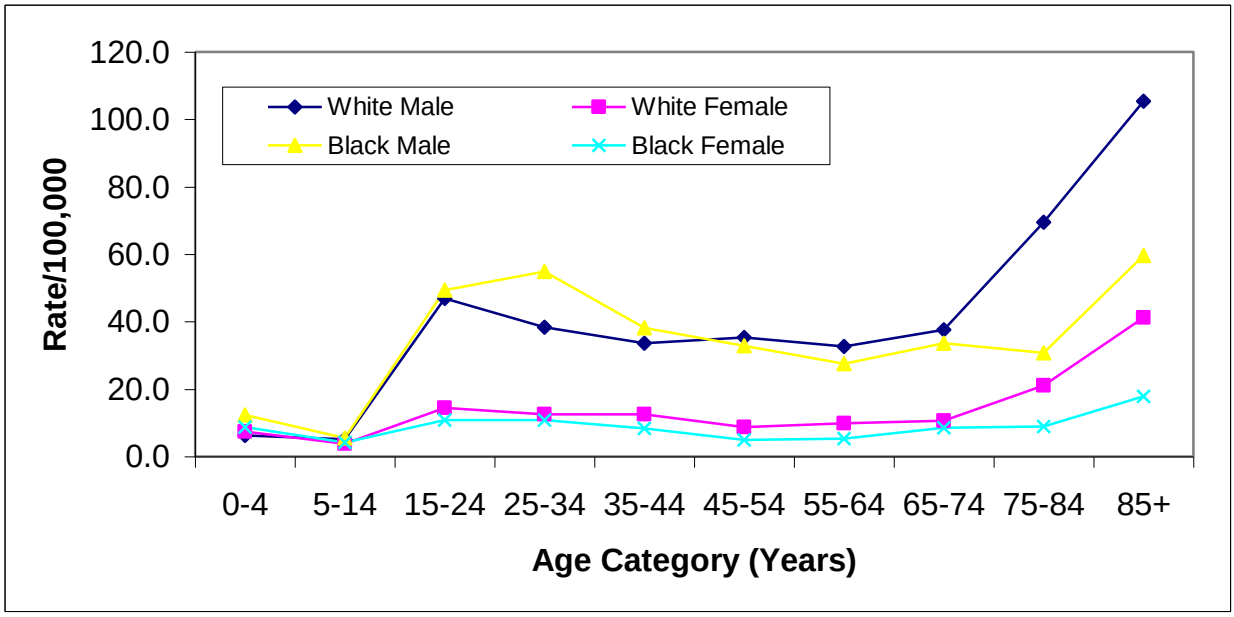
Mean Annual TBI Mortality Rates by Race and Gender, LA 2000-2005
(N=)



Males consistently have higher mortality rates. The rate for white males and black males was nearly the same (33.1 per 100,000 Louisiana residents and 32.1 per 100,000 respectively). White females had a higher rate of TBI mortality (11.6 per 100,000) than the rate for black females (7.9 per 100,000).

Figure 4

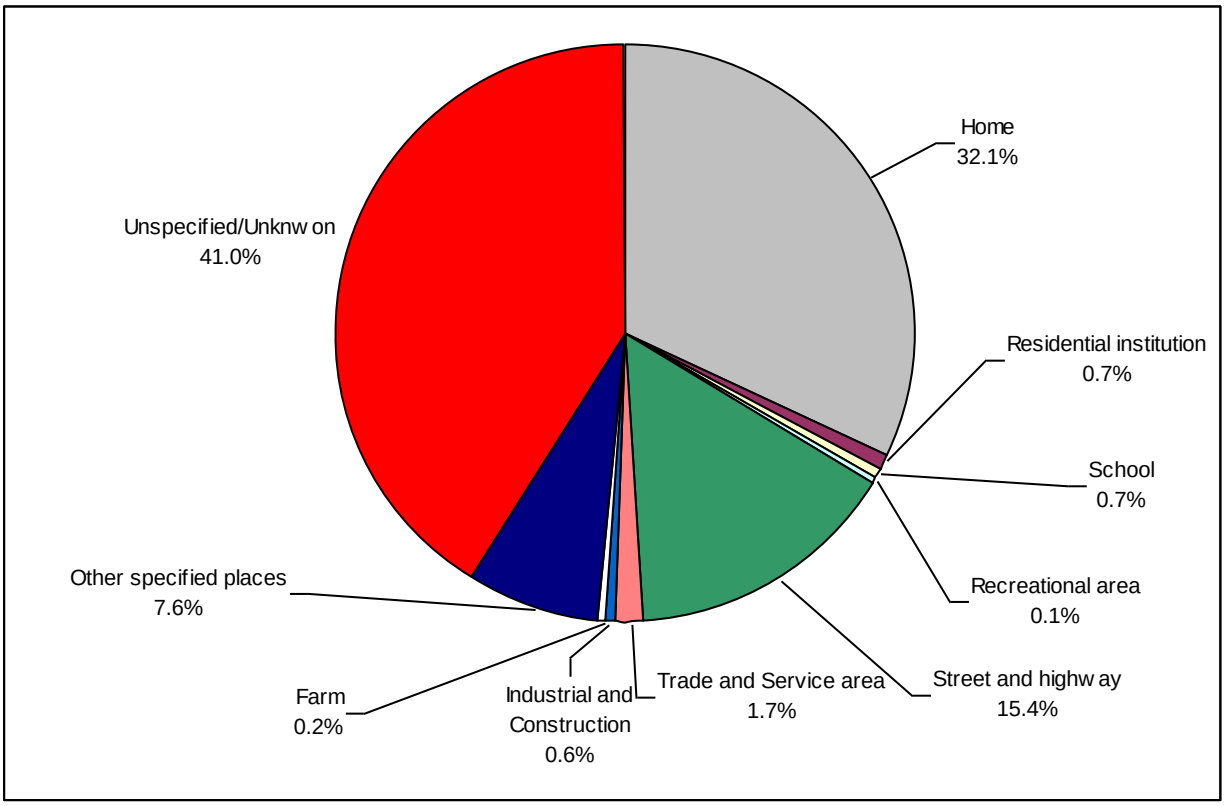
TBI Mortality Rates by Age Category, Race, and Gender, LA 2000-2005
(N=)



This figure shows TBI mortality rates by age category as well as race and gender. All four race and gender groups show black males having a higher mortality rate in the age group 15-44 and white males have a high mortality rate in the 65+ age group. Looking at all the age groups the rates for females are generally lower than the rates for males.

Figure 5

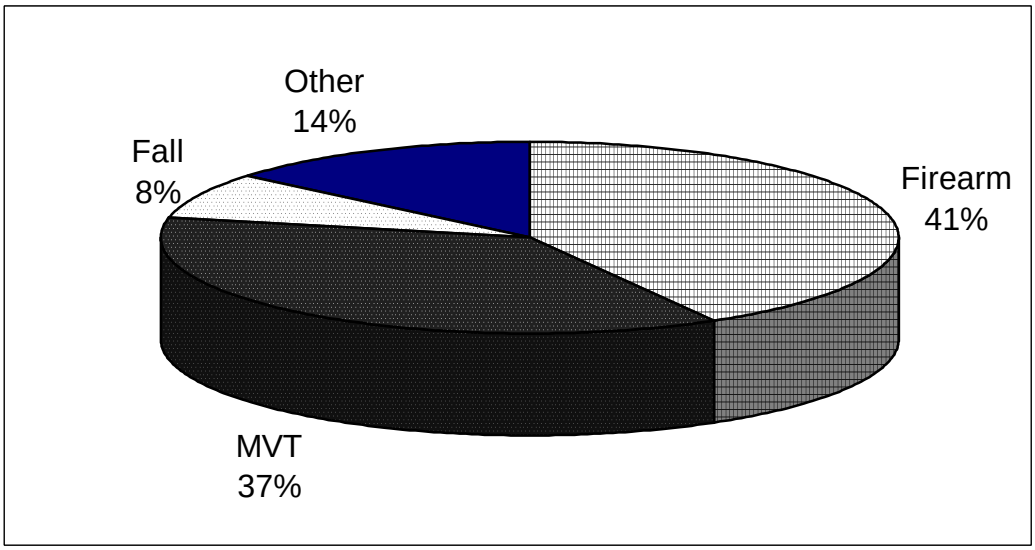
Place of Injury of Traumatic Brain Injuries Mortality, LA 2000-2005
(N=5596)



For those in which place of injury is known, 33% of all TBI deaths occurred at home or residential facility (i.e. nursing home). An additional 15% occurred on a public street or highway. Large number of traumatic brain injury deaths were unknown..

Figure 6

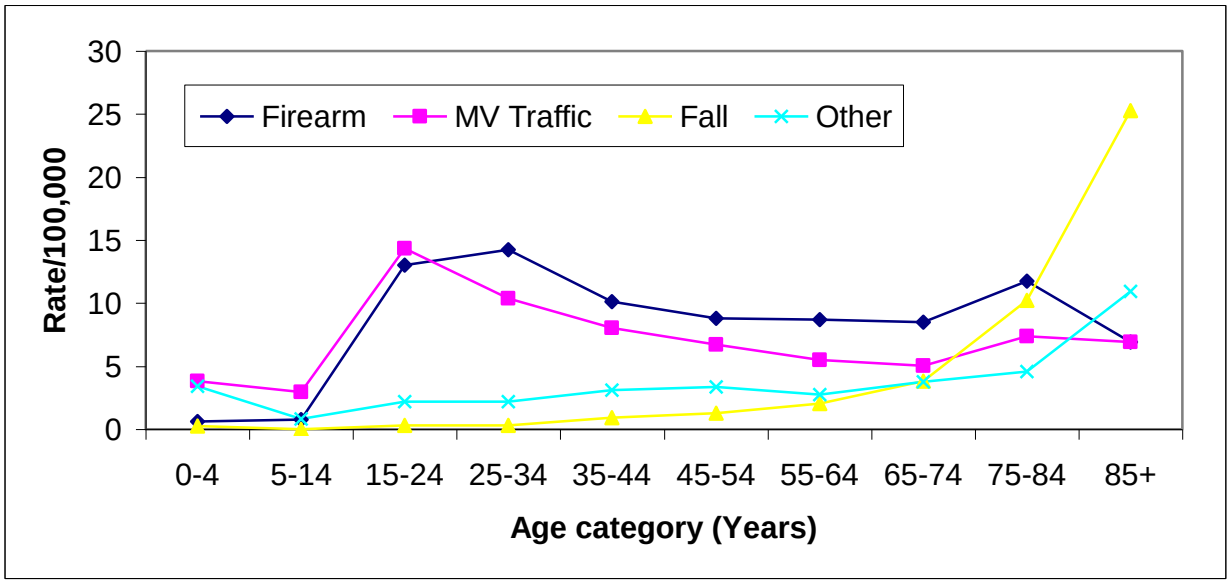
External Cause of Traumatic Brain Injury Mortality, LA 2000- 2005
(N=)



For those in which the external cause of injury was known, firearms were the leading cause of traumatic brain injury deaths between 2000 and 2005, accounting for almost one half of injuries. An additional one-third of TBI deaths from 2000 to 2005 were the result of motor vehicle crashes (which includes bicycle and pedestrian-related crashes)

Figure 7

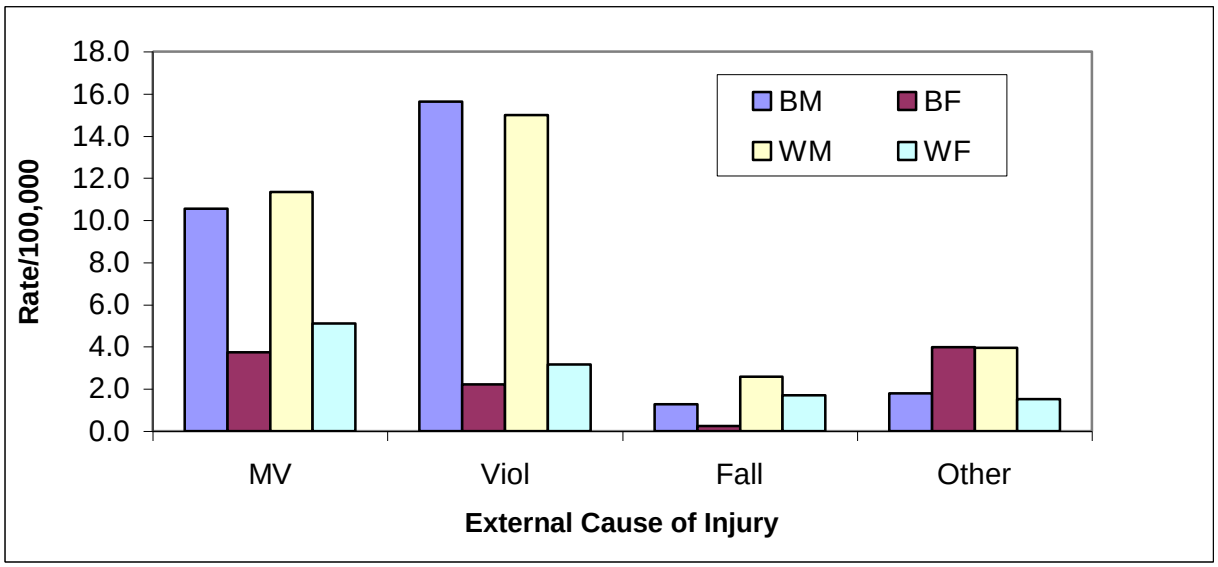
Estimated TBI Mortality Rates by Age and Cause of Injury, LA 2000-2005
(N=)



The estimated age-specific mortality rates from 2000 to 2005 for firearms were highest in the 25-34 age group whereas motor vehicle crashes were highest among the 15-24 year age group. Mortality rates were significantly higher for those 75 years of age or older for fall-related traumatic brain injuries as compared to all other causes.

Figure 8

Estimated TBI Mortality Rates by Cause of Injury, Race, and Gender, LA 2000-2005
(N=)



Looking at the top 3 causes of injury…… Overall, TBI mortality rates were higher among males than females for all external causes of injury except falls. Black males had the highest rate of violence due to firearm (15.6 per 100,000) and motor vehicle related TBI (10.6 per 100,000).

HIGHLIGHTS: Selected Traumatic Brain Injuries (Figures)

Figure

Motor Vehicle Crash-Related TBI deaths, LA 2000-2005
(N=)

	No. of Deaths	Percent
MVT Occupant	392	19.1
MVT Motorcyclist	133	6.5
MVT Pedal Cyclist	37	1.8
MVT Pedestrian	212	10.3
MVT Unspecified & Other	1,279	62.3
Total	2,053	100.0

There were 2053 motor vehicle crashes resulting in TBI deaths from 2000 to 2005. Almost one fifth 19.1% of these crashes were to the driver or passenger of a car or truck. Eight percent of TBI were to drivers or passengers of other types of vehicles (i.e. motorcycles, all-terrain vehicles, or bicycles). Pedestrians struck by vehicles accounted for 10% of TBI.

Fall-Related TBI deaths by Fall Type, LA 2000-2005

Of those persons sustaining a fall-related traumatic brain injury death, majority of the falls were coded as unspecified, hence we were unable to determine the exact circumstance of the fall.

Firearm-Related TBI LA 2000-2005
(N=)

Case Definition

The following case definitions are those recommended by the Centers for Disease Control and Prevention.

Traumatic Brain Injury

A case of traumatic brain injury (TBI) is defined as either an occurrence of injury to the head that is documented in a medical record with one or more of the following conditions attributed to head injury:

- observed or self-reported decreased level of consciousness
- amnesia
- skull fracture
- objective neurological or neuropsychological abnormality
- diagnosed intracranial lesion
- occurrence of death resulting from trauma, with head injury listed on the death certificate, autopsy report, or medical examiner's report in the sequence of conditions that resulted in death [4]

Spinal Cord Injury

A case of spinal cord injury is defined as the occurrence of an acute traumatic lesion of neural elements in the spinal canal (spinal cord and cauda equina), resulting in any degree of sensory deficit, motor deficit, or bowel or bladder dysfunction, either temporary or permanent.

The clinical definition of spinal cord injury excludes the following:

- intervertebral disc disease
- vertebral injuries in the absence of spinal cord injury
- nerve root avulsions and injuries to nerve roots and peripheral nerves outside the spinal canal
- birth trauma
- cancer, spinal cord vascular disease, and other nontraumatic spinal cord diseases[4]

Methods

The Louisiana TBI surveillance system has two components: mortality data.

Mortality Data

Louisiana maintains a file of all deaths of state residents. These data include information concerning residence, gender, race, date of birth, date of death, place of injury, and ICD-9 codes[8] for the nature and external cause of injury, and personal identifiers. To capture pre-hospitalization deaths, these data were queried for persons who died as a result of a TBI from 2000 to 2005.

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